Mine Examination Report
October 27, 1978

The Anaconda Company
Jackpile-Paguate Mine
Pueblo of Laguna Uranium Leases 1 and 4
Laguna Indian Reservation
Townships 10 and 11 North, Range 5 West, NMPM
Valencia County, New Mexico

U. S. Geological Survey
Conservation Divison
Area Mining Supervisor
Southern Rocky Mountain Area
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November 6, 1978

October 27, 1978, the writer inspected the open-pit mining operations at The Anaconda Company's Jackpile-Paguate Mine. He was accompanied throughout the inspection by Mr. Robert Chambers, Chief Mine Engineer for the open-pit operations. The purpose of the inspection was the examination of the active mining areas.

The open-pits are designated the Paguate and Jackpile Pits. The western Paguate Pit is situated within Pueblo of Laguna Uranium Leases 1 and 4 and is arbitrarily divided into the North and South Paguate Pits (NP and SP). The eastern Jackpile Pit is totally within Lease 1 and is also divided into the North and South Jackpile Pits (NJ and SJ). The ore zones within the individual pits are given numerical designations, and the mining areas, or pushbacks, are therefore identified by combinations of pit and ore zone designations (e.g. SP-20, NJ-24, etc). The individual pushbacks and associated features are shown on the 400-scale map titled "Jackpile-Paguate Mine 1979-1983 Mining Plan," and relevant portions of this map are attached.

At the time of this inspection, there was only one active mining area in the Paguate Pit. Ore zone mining was being conducted in the SP-20 pushback (see attached map) with all ore being trucked to stockpiles 4 and 6. The contents of stockpile 4 average about 0.15% U_3O_8 while those of stockpile 6 average between 0.40 to 0.50% U_3O_8. Mining will continue in the pushback through the first week of November when the operations will be tranferred to the SP-9 pushback about 1 mile to the east-northeast (see attached map). Ore zone mining will be completed in the SP-9 pushback before returning to the SP-20 area where mining should conclude in December 1978 or January 1979. All overburden stripping has been completed for the SP-9 pushback, and ore zone mining must be completed in the near future so that waste material from the SP-16 pushback (see attached map) can be backfilled into the mined out area. The SP-16 pushback is approximately 1400 feet south-southeast of the SP-9 area.

Mining in the SP-20 pushback has been hampered by serveral factors during the past few months. One of the larger ore haulage trucks severely damaged the main scanner station for the Paguate Pit, and mining was halted for 3 weeks while the necessary repairs were made. Recent rains created difficult operating conditions for several days and finally resulted in a 2-day cessation of operations October 25 and 26. In addition, mining in the southwest end of the SP-20 pushback was slowed somewhat due to minor slope stabiltiy problems where the open-pit operations broke into mined-out areas of the P-10 underground mine (see attached map). Fortunately, the stability problems were not serious, the most significant being

the slight subsidence of a bench overlying a caved stope. Because of the delays caused by the above problems, several small ore zone remnants in the bottom of the North Paguate Pit may not be recovered until the first of 1979 instead of the last of 1978 as originally planned. As previously mentioned, the SP-20 pushback is the farthest southwest extension of the South Paguate Pit that is presently planned; however, Mr. Chambers noted that economic conditions could warrant another pushback in this area when State Highway 279 has been rerouted. Such a pushback would recover ore not extracted through the P-10 and P-7 underground mining operations.

The Jackpile Pit had two active mining areas at the time of this inspection. Ore zone mining was being conducted in the NJ-24, -28, and -28 North pushbacks just due west of Gavilan Mesa (see attached map) with the ore being trucked to nearby stockpiles 9, 10, or 11. The contents of stockpile 9 average about 0.10% U_3O_8, and those of stockpile 10 average between 0.16 and 0.17% U_3O_8. The ore in stockpile 11 averages approximately 0.50% U_3O_8. The mining in the NJ-24, -28 and -28 North pushbacks will be stopped in the very near future due to the renewal of operations in the SP-20 and SP-9 pushbacks, and said mining will not resume until completion of the South Paguate operations unless inclement weather dictates otherwise. Mining during inclement weather is easier in the NJ-24, -28, and -28 North pushbacks due to the shorter haulage distances and less mud involved. When the SP-9 and SP-20 pushbacks have been completed, the ore zone mining operations will return to the North Jackpile pushbacks.

The second active area in the Jackpile Pit is on the northwest end of Gavilan Mesa where overburden stripping for the NJ-17 and -23, -27, -32, -37, and -45 has begun (see attached map). A private contractor, Hamilton Construction, is performing this stripping utilizing a fleet of Caterpillar equipment consisting of various bulldozers, seven front-end loaders, four 50-ton trucks and fifteen 85-ton trucks. Six of the front-end loaders are the largest made by Caterpillar (992C) having 12.5-cubic yard buckets. These stripping operations began at the top of the mesa at an elevation of about 6400 feet and will continue until the ore horizon (Jackpile Sandstone) is encountered at an elevation of about 5920 feet. The benching is accomplished with 70 feet high lifts (35-foot lift per bench) and 40 feet wide safety berms which results in an overall overburden slope of approximately 62 degrees. Ore zone mining will be conducted by Anaconda with an overall pit slope of 45 degrees, and the mining will end at elevations ranging from 5800 to 5850 feet. At the time of inspection, stripping of the third and fourth benches (6270 feet of elevation) was underway. According to Mr. Chambers, this area of the Jackpile Pit has been drilled from the surface only

to the extent that economical recovery of the ore by open-pit mining has been determined. When the ore horizon is reached, additional drilling and probing will be performed to accurately determine the ore reserves involved.

The stripping operations on the northwest end of Gavilan Mesa are of some concern due to the creation of new waste dumps for the overburden removed. Material from the first two stripping benches was trucked to a topsoil stockpile on top of the mesa for later use in reclamation activities. Material from the third stripping bench was dumped over the southeast edge of the mesa thereby creating a small, new waste dump, which is quite visible due to a black shale encountered in the bench. Overburden material from the fourth bench to the ore horizon is and will be trucked to a new, large waste dump north of the mining push-backs. The Geological Survey feels that as much of the overburden as possible should be used to backfill mined-out areas of the open-pit, but such disposition is possibly prevented by operational considerations. It is also noted that the comprehensive mining and reclamation plan for the Jackpile-Paguate Mine as submitted by Anaconda does provide for 210 additional acres of new waste dumps, but there is not a map in this plan that shows the locations of the new dumps. The 400-scale map "Jackpile-Paguate Mine 1979-1983 Mining Plan" does show the locations of the two dumps in question (see attached map).

Through the month of September 1978, the open-pit mining operations produced 129,914 tons of ore containing 0.129% U_3O_8 and 99,507 tons of low grade ore, or protore, containing 0.029% U_3O_8. During the same period, the private contractor stripped 2,657,545 tons of overburden, and Anaconda removed an additional 722,243 tons of waste associated with the ore and protore. Total material removed in September 1978 was 3,609,209 tons. Through October 26, 1978, the open-pit operations had produced 161,017 tons of ore averaging 0.106% U_3O_8 and 123,563 tons of protore containing 0.028% U_3O_8. Mr. Chambers noted the private contractor is now performing all overburden stripping at a rate of approximately 2.5 million tons per month with an expected increase to about 3.0 million tons per month by early 1979. Anaconda will soon receive some new mining equipment from a closing operation in Nevada and hopes to use this equipment to increase ore production. Mr. Chambers also noted that Anaconda is now beginning to ship low grade ore from stockpiles in the open-pits to the Bluewater Mill for processing.

During the inspection, the writer questioned Mr. Chambers about percentage extraction (recovery) in the open-pit mining operations. According to Mr. Chambers, percentage extraction is not calculated for the open-pit mining as it is for the underground mining. Tonnages extracted are compared only against in-place tonnages

calculated from surface drilling, and, to Mr. Chambers' knowledge, the tonnages extracted have always been greater than the calculated tonnages. In the underground mining, tonnages extracted are compared against tonnages calculated from surface drilling, tonnages calculated from underground longhole drilling and against tonnages calculated from stope development. These different comparisons can result in different percentage extraction rates.

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Original to: Superintendent, Southern Pueblos Agency, BIA
cc: Governor, Pueblo of Laguna
Chief, BOMO, USGS
Through: Conservation Manager, CR, USGS
Files (No. 1 and No. 4)